

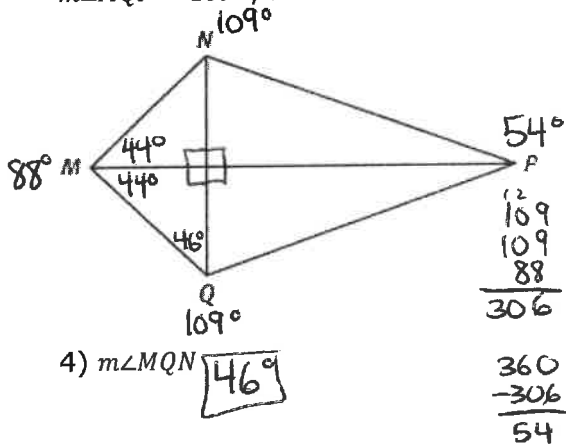
For this exam, make sure to look over **all** notes that you have been given, including vocabulary, **all** Extra Practice handouts, Properties of Quadrilaterals, and the Venn diagram showing how different quadrilaterals relate to each other.

Kites

Answer the following questions with *always, sometimes, or never*.

- 1) The diagonals of a kite are always perpendicular.
- 2) The diagonals of a kite never bisect each other.
- 3) The diagonals of a kite are never congruent.

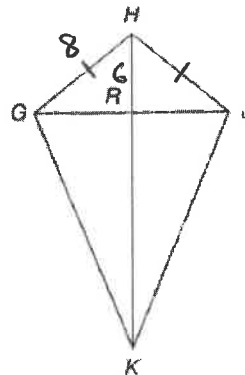
In kite $MNPQ$, \overline{MP} is the perpendicular bisector of \overline{NQ} . If $m\angle NMQ = 88^\circ$ and $m\angle MQP = 109^\circ$, find each measure.



5) $m\angle NPQ$ 54°

6) $m\angle NMP$ 44°

In the following kite, $GH = 8$ and $HR = 6$. Find the following measures. Give exact answers.



7) HJ $HJ = 8$

8) GR $(GR)^2 = (GH)^2 - (HR)^2$
 $(GR)^2 = 8^2 - 6^2 = 64 - 36$
 $(GR)^2 = 28$
 $GR = \sqrt{28}$
 $GR = 2\sqrt{7}$

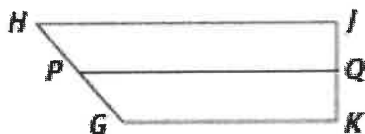
9) GJ $GJ = 2(GR)$
 $GJ = 2(2\sqrt{7})$
 $GJ = 4\sqrt{7}$

Trapezoids

Answer the following questions with *always, sometimes, or never*.

- 10) The diagonals of an isosceles trapezoid are always congruent.
- 11) The opposite angles of an isosceles trapezoid are always supplementary.
- 12) The consecutive angles of a trapezoid are sometimes supplementary. (leg angles)
- 13) In an isosceles trapezoid, the legs are always congruent.

14) $GHIK$ is a trapezoid and \overline{PQ} is the median.



If $PQ = 4x - 8$, $GK = 2x$, and $HJ = 5x - 9$, find PQ .

$$PQ = \frac{1}{2}(GK + HI)$$

$$4x - 8 = \frac{1}{2}(2x + 5x - 9)$$

$$8x - 16 = 7x - 9$$

$$x = 7$$

$$PQ = 4(7) - 8$$

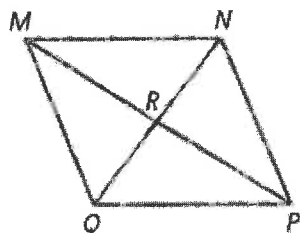
$$PQ = 20$$

Parallelograms

Answer the following questions with *always*, *sometimes*, or *never*.

- 15) The diagonals of a parallelogram always bisect each other.
- 16) The diagonals of a parallelogram are sometimes congruent.
- 17) The opposite angles of a parallelogram are always congruent.
- 18) The opposite sides of a parallelogram are always congruent.

$MNPQ$ is a parallelogram. The diagonals intersect at point R .



19) If $MR = 2x - 8$ and $MP = 3x - 5$, what is PR ?

$$2(MR) = MP$$

$$2(2x - 8) = 3x - 5$$

$$4x - 16 = 3x - 5$$

$$x = 11$$

$$PR = 2(11) - 8$$

$$PR = 14$$

20) If $m\angle QMN = 78^\circ$, determine $m\angle MNP$, $m\angle NPQ$, and $m\angle PQM$.

$$m\angle MNP = 102^\circ$$

$$m\angle NPQ = 78^\circ$$

$$m\angle PQM = 102^\circ$$

21) If $MN = 3x - 20$ and $PQ = 70$, find x .

$$MN = PQ$$

$$3x - 20 = 70$$

$$3x = 90$$

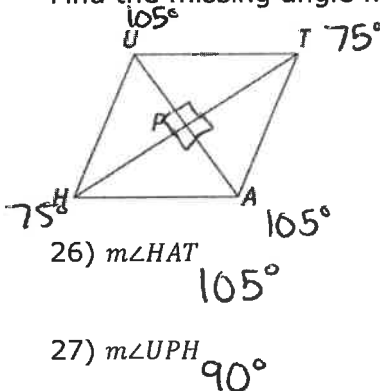
$$x = 30$$

Rhombi

Answer the following questions with *always*, *sometimes*, or *never*.

- 22) The diagonals of a rhombus are always perpendicular and bisect each other.
- 23) The diagonals of a rhombus always bisect opposite angles.
- 24) The diagonals of a rhombus are sometimes congruent.
- 25) The sides of a rhombus are always congruent.

In the following rhombus, $m\angle UTA = 75^\circ$. Find the missing angle measures.



- 26) $m\angle HAT = 105^\circ$
- 27) $m\angle UPH = 90^\circ$
- 28) $m\angle UTH = 37.5^\circ$
- 29) $m\angle TAP = 52.5^\circ$

Rectangles and Squares

Answer the following questions with *always, sometimes, or never*.

30) The diagonals of a rectangle are always congruent.

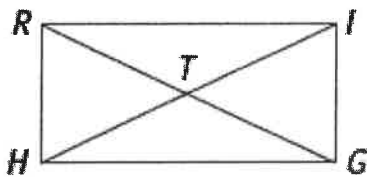
31) The diagonals of a rectangle are sometimes perpendicular. (square)

32) The diagonals of a rectangle always bisect each other.

33) The diagonals of a square always bisect each other.

34) The opposite sides of a rectangle are always congruent.

Quadrilateral *RIGH* is a rectangle.



35) If $m\angle RHT = x + 9$ and $m\angle GIT = 2x - 44$, find $m\angle IHG$.

$$m\angle RHT + m\angle IHG = 90^\circ$$

$$m\angle RHT = m\angle GIT$$

$$x + 9 = 2x - 44$$

$$53 = x$$

$$m\angle RHT = 62^\circ$$

$$62^\circ + m\angle IHG = 90^\circ$$

$$m\angle IHG = 28^\circ$$

36) If $RT = 5x + 10$ and $TG = 7x$, find HT .

$$RT = TG$$

$$5x + 10 = 7x$$

$$10 = 2x$$

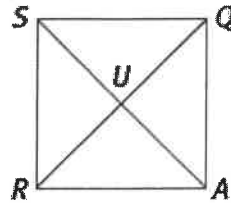
$$5 = x$$

$$HT = TG$$

$$HT = 7(5)$$

$$HT = 35$$

Quadrilateral *SQAR* is a square.



37) If $QA = 8$, what is the length of diagonal \overline{QR} ?

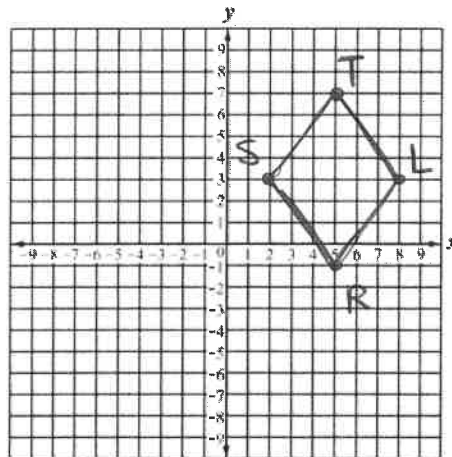
$$QR = 8\sqrt{2}$$

38) If the perimeter of the square is 48 inches, what is QR ? Give an exact answer.

$$\text{side} = 12 \text{ inches}$$

$$QR = 12\sqrt{2} \text{ inches}$$

39) Given quadrilateral *STLR* with $S(2,3)$, $T(5,7)$, $L(8,3)$, and $R(5,-1)$. What could the name(s) of this quadrilateral be?



$$\overline{ST} \cong \overline{TL} \cong \overline{LR} \cong \overline{RS}$$

Slope of \overline{ST} and \overline{LR} is $\frac{4}{3}$
 slope of \overline{TL} and \overline{RS} is $-\frac{4}{3}$

parallelogram and rhombus